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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,743	07/22/2003	Craig Davis	302001-1010	7152
24504	7590	12/15/2005		
THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP 100 GALLERIA PARKWAY, NW STE 1750 ATLANTA, GA 30339-5948			EXAMINER HOEL, MATTHEW D	
			ART UNIT 3713	PAPER NUMBER

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/624,743	Applicant(s) DAVIS ET AL.	
	Examiner Matthew D. Hoel	Art Unit 3713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2003.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-22 is/are rejected.
 7) ☒ Claim(s) 18 is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
 10) ☒ The drawing(s) filed on 22 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>07/22/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed July 22nd, 2003 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because there was no copy of "Spacecraft Dynamics and Control," Pages 100 to 105. All of the other documents on the IDS have been considered. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Specification

2. The use of the trademark STIMPMETER TM has been noted in this application (Page 25, Line 5). It should be capitalized wherever it appears and be accompanied by the generic terminology (for example, "an apparatus for measuring the speed of a green").
3. Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner that might adversely affect their validity as trademarks.

Claim Objections

4. Claim 18 is objected to because of the following informalities: An “inertial management unit” cited in the last line should read “inertial measurement unit” to be consistent with the rest of the claim and with the other claims. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

6. The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 15 contains the trademark/trade name STIMPMETER TM (United States Golf Association, Far Hills, N.J.). Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe an apparatus for measuring the speed of a golf green, and, accordingly, the identification/description is indefinite. Citing “functionality for measuring the speed of a golf green” would overcome this rejection.

8. Claim 14 recites the limitation "...from the first point to the second point." There is insufficient antecedent basis for this limitation in the claim. The examiner believes the applicants intend to say "...from the first position to the second position..." after reciting "...a first position and a second position..." earlier in the claim. Claims should have antecedent basis by stating "a (limitation)" followed by "(the or said) (limitation)" in the rest of the claim and in every claim thereafter. Correction is required.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

10. A person shall be entitled to a patent unless –

11. (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claim 1 to 3, 6, 10, 17, 20, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Tuer, et al. (U.S. pre-grant publication 2002/0077189 A1, application 10/016,965).

13. As to Claim 1: Tuer in '189 teaches a golf club with a 6DOF inertial measurement unit disposed within the head of the golf club (Fig. 1; Para. 26, 27, and 29). '189 also teaches a microprocessor in communication with the 6DOF inertial measurement unit, the microprocessor being configured to receive data from the 6DOF inertial measurement unit and determine the translational and rotational motion of the head of the golf club (Abstract, Para. 37).

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14. As to Claims 2 and 3: The golf club being a putter, an iron, or a wood is an obvious design choice.

15. As to Claim 6: '189 teaches a golf club with a kinematic reference model stored in memory, wherein the microprocessor is configured to compare the motion of the head of the golf club to the kinematic reference model (Para. 43 to 45).

16. As to Claim 10: '189 has a feedback mechanism in communication with the microprocessor, with the feedback mechanism being configured to provide information to a user of the golf club based on the comparison of the motion of the head of the golf club and the kinematic reference model (Para. 43 to 45).

17. As to Claim 17: The microprocessor of '189 is configured to determine the motion of the object by performing a gravity-cancellation algorithm (Para. 24).

18. As to Claim 20: In '189, the 6DOF inertial measurement unit and the microprocessor are rigidly fixed within the head of the golf club (Para. 26, 27, and 29).

19. As to Claim 21: Having the physical properties of the 6DOF inertial measurement unit, the microprocessor, and the head of the golf club comply with the rules of golf promulgated by the United States Golf Association and the Royal and Ancient Golf Club of St. Andrews would be an obvious design choice to one of ordinary skill in the art, as all recognized golf courses follow these rules.

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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21. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

23. Determining the scope and contents of the prior art.

24. Ascertaining the differences between the prior art and the claims at issue.

25. Resolving the level of ordinary skill in the pertinent art.

26. Considering objective evidence present in the application indicating obviousness or nonobviousness.

27. Claims 4, 5 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuer ('189) in view of Bachmann, et al. (U.S. patent 6,820,025 B2).

28. As to Claim 4: Tuer in '189 teaches all of the elements of Claim 4, but lacks specificity as to the microprocessor being configured to determine the motion of the head of the golf club using a Quaternion algorithm. Bachmann, however, in '025 teaches determining the motion of an object using a Quaternion algorithm (Col. 7, Lines 51 to 62). It would be obvious to one of ordinary skill in the art to apply the Quaternion algorithm of '025 to the instrumented golf club of '189. Euler algorithms (the alternative to Quaternion algorithms) can be used, but they require much processing time, especially when multiple moving bodies are being tracked in real time (Col. 7, Lines 8 to 26). Also, Euler methods do not allow roll and azimuth axes to be uniquely defined. Using Quaternion methods delivers a 100-fold increase in mathematical efficiency, which is especially important in an application like a microprocessor inside a golf-club head, which would have limited power, processing speed, and memory. The

Quaternion method of '025 is meant to be used with accelerometers and rate detectors (Col. 7, Line 64 to Col. 8, Line 28), like the invention of '189 (Para. 11). The advantage of this combination would be to improve the calculating efficiency of the microprocessor in the golf club's head, which would save power and maintain accuracy.

29. As to Claim 5: The invention of '025 can use Euler angle algorithms, although it is not ideal (Col. 7, Lines 33 to 51).

30. As to Claim 22: The microprocessor of '025 is configured to initialize and inertial reference frame using a gravity vector (Col. 5, Lines 49 to 60).

31. Claims 7 to 9, 11, 12, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuer ('189) and Bachmann ('025) in view of Perlmutter (U.S. pre-grant publication 2002/0123386 A1, application 10/134,357).

32. As to Claim 7: The combination of Tuer ('189) and Bachmann ('025) discloses all of the elements of Claim 7, but lacks specificity as to the golf club being a putter and the microprocessor being configured to determine whether the head of the putter rotates beyond a certain threshold during a putting stroke. Perlmutter, however, in '386 teaches the golf club being a putter (Fig. 1). The putter of '386 determines whether the head of the putter moves beyond a certain threshold during a putting stroke (Para. 34, 35, and 37). It would be obvious to one of ordinary skill in the art to apply the threshold determination of '386 to the combination of '189 and '025. '386 is an instrumented golf club for providing a player feedback to improve his or her game (Abstract, Fig. 1), like the golf club of '189 (Abstract, Fig. 1). The motion detectors of '386 comprise rate

sensors and accelerometers (Para. 48), like the motion detectors of '189 (Para. 24) and '025 (Col. 8, Lines 8 to 12). The advantage of this combination would be to enhance the usefulness of the feedback given to the player by helping him or her hit the ball with the face of the club centered on the ball and not at an angle.

33. As to Claim 8: The microprocessor of the putter of '386 is configured to determine whether, during a putting stroke, the head of the putter deviates from the target line by a predetermined threshold (Para. 38; centerline 107, Fig. 1).

34. As to Claim 9: The microprocessor of the putter of '386 is configured to determine the acceleration of the head of the putter through impact of the ball, and provide feedback based on the determined acceleration (Para. 40).

35. As to Claim 11: The feedback mechanism of '386 comprises a display (Fig. 6).

36. As to Claim 12: The feedback mechanism of '386 employs an audio cue (Para. 73).

37. As to Claims 18 and 19: '386 has a mode-switching mechanism, which could be a switch, adapted to enable a user to select between a training mode in which the 6DOF inertial measurement unit and the microprocessor are engaged and a competition mode in which the 6DOF inertial management unit and the microprocessor are disengaged (Para. 61 to 63).

38. Claims 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuer ('189), Bachmann ('025), and Perlmutter ('386) in view of Faulkner, et al. (6,869,288 B1).

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39. As to Claim 13: The combination of Tuer ('189), Bachmann ('025), and Perlmutter ('386) discloses all of the elements of Claim 13, but lacks specificity as to determining the distance or elevation between a first position and a second position based on the movement of the head of the golf club from the first position to the second position. Faulkner, however, in '288 teaches indicating lengths of golf swings (backswings and follow-throughs), which would be based on the movement of a head of a golf club from a first position to a second position (Col. 9, Lines 40 to 45). It would be obvious to one of ordinary skill in the art to apply the indication of swing length taught in '288 to the combination of '189, '025, and '386. '288 teaches that such indications could take the form of audio cues and electronic sensors (Col. 9, Lines 46 to 48). '386 employs an audio cue to provide feedback to a player (Para. 73). '189 and '386 both use sensors to track the motion of the head of a golf club ('189, Fig. 1, Para. 26; '386, Fig. 1, Para. 40). '386 is used to analyze golf swings (Para. 42), and has gyroscopes and sensors in the golf club's head to measure velocity and acceleration (Para. 50 and 51), so it would be natural to want to measure the distance of the swing as well. '288 expressly states that its preferred embodiment could be modified for incorporation into another device for providing indications of swing length (Col. 9, Lines 39 to 45). The electronic sensors mentioned by '288 could be the gyroscopes and accelerometers of '386. The advantage of this combination would be to enhance the feedback to the user by providing swing distance as well as velocity and acceleration.

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40. As to Claim 16: '288 calculates the amount of break to be applied by a golfer based on the orientation of the face of the putter relative to the ball-to-hole line (Table 2; Col. 9, Lines 39 to 58).

41. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuer ('189), Bachmann ('025), Perlmutter ('386), and Faulkner ('288) in view of Crook, et al. (U.S. patent 6,705,942 B1).

42. As to Claim 14: The combination of Tuer ('189), Bachmann ('025), Perlmutter ('386), and Faulkner ('288) discloses all of the elements of Claim 14, but lacks specificity as to having logic configured to compare the distance of a drawback or a follow-through to the distance of travel of the ball struck by the head of the putter. '288 teaches logic configured to determine, based on the movement of the head of a putter during a stroke, the drawback distance or the follow-through distance (Col. 9, Lines 39 to 58). Crook, however, in '942 teaches determining the distance of a ball struck by a golf club, which could be a putter (Col. 18, Line 22; 1506, Fig. 15). It would be obvious to one of ordinary skill in the art to apply the distance determination of '942 to the combination of '189, '025, '386, and '288. '942 gives feedback to players to help them improve their games (Abstract), like the systems of '189, '386, and '288. '942 has a visual display giving feedback on a player's game (Fig. 11A), like '386 (Fig. 6). This combination would yield logic able to compare the distance of the drawback or follow-through to the distance traveled by the ball struck by the golf club's head. The

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advantage of this combination would be to enhance feedback to the user by letting him or her know how far the ball traveled in relation to how accurately the player hit the ball.

43. As to Claim 15: It is inherent that the combination of '189, '025, '386, '288, and '942 would have a STIMPMETER TM comprising logic configured to calculate the "green speed" of a green based on the impact velocity of the putter head and the resulting distance the ball travels on the green. '189 (Para. 11) and '386 (Para. 50) both have gyro sensors capable of detecting the velocity of the golf club head. '942 determines the distance the ball travels when hit (Col. 18, Line 22; 1506, Fig. 15).

Citation of Pertinent Prior Art

44. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In U.S. pre-grant publication 2004/0259651, application 10/605,414, Storek teaches accelerometers and gyroscopes in a golf-club head. In U.S. patent 6,441,745 Gates teaches an instrumented golf club. In U.S. patents 6,402,634 and 6,224,493, Lee, et al. teach instrumented golf clubs. In U.S. pre-grant publications 2002/0005695, 2002/0107085, and 2001/0053720, Lee, et al. teach instrumented golf clubs. In U.S. patent 6,413,167 and U.S. pre-grant publication 2002/0052246, Burke teaches a golf overswing alerting mechanism. In U.S. patent 6,196,932, Marsh, et al. teach an instrumented golf club. In U.S. patent 5,792,001, Henwood teaches a putting stroke-training device. In U.S. patent 5,779,555, Nomura,

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et al. teach a golf swing practice apparatus. In U.S. patent 6,173,610, Pace teaches an impact speed indicator.


Conclusion

45. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew D. Hoel whose telephone number is (571) 272-5961. The examiner can normally be reached on Mon. to Fri., 8:00 A.M. to 4:30 P.M.

46. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Xuan M. Thai can be reached on (571) 272-7147. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

47. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Matthew D. Hoel, Patent Examiner
AU 3713



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